

The Proceedings

OF

THE INSTITUTION OF ELECTRICAL ENGINEERS

FOUNDED 1871: INCORPORATED BY ROYAL CHARTER 1921

ISSUED IN THREE PARTS AS FOLLOWS:

Part A. POWER ENGINEERING (February, April, etc.)

Part B. RADIO AND ELECTRONIC ENGINEERING (INCLUDING COMMUNICATION ENGINEERING)

(January, March, etc.)

Part C. INSTITUTION MONOGRAPHS (March and September only)

PART B

RADIO AND ELECTRONIC ENGINEERING (INCLUDING COMMUNICATION ENGINEERING)

VOLUME 102, 1955

The Institution of Electrical Engineers

FOUNDED 1871

INCORPORATED BY ROYAL CHARTER 1921

PATRON: HER MAJESTY THE QUEEN

COUNCIL 1954-1955

President

J. Eccles, C.B.E., B.Sc.

Past-Presidents

SIR JAMES SWINBURNE, BART, F.R.S. W. H. ECCLES, D.Sc., F.R.S.
THE RT. HON. THE EARL OF MOUNT EDGCUMBE, T.D. J. M. Donaldson, M.C.
PROFESSOR E. W. MARCHANT, D.Sc.
P. V. HUNTER, C.B.E.
H. T. YOUNG. SIR GEORGE LEE, O.B.E., M.C.
SIR ARTHUR P. M. FLEMING, C.B.E., D.Eng., LL.D.
J. R. BEARD, C.B.E., M.Sc. SIR NOEL ASHBRIDGE, B.Sc.(Eng.).

COLONEL SIR A. STANLEY ANGWIN, K.B.E., D.S.O., M.C., T.D., D.Sc.(Eng.).
SIR HARRY RAILING, D.Eng.
P. DUNSHEATH, C.B.E., M.A., D.Sc.(Eng.).
SIR VINCENT Z. DE FERRANTI, M.C. T. G. N. HALDANE, M.A. PROFESSOR E. B. MOULLIN, M.A., Sc.D. SIR ARCHIBALD J. GILL, B.Sc.(Eng.). SIR JOHN HACKING.
COLONEL B. H. LEESON, C.B.E., T.D.
SIR HAROLD BISHOP, C.B.E., B.Sc.(Eng.).

Vice-Presidents

WILLIS JACKSON, D.Sc., D.Phil., F.R.S. SIR GEORGE H. NELSON, BART. SIR W. GORDON RADLEY, C.B.E., Ph.D.(Eng.).

Honorary Treasurer H. W. GRIMMITT.

Ordinary Members of Council

J. BENNETT. A. R. COOPER. A. T. CRAWFORD, B.Sc C. DANNATT, O.B.E., D.Sc. B. DONKIN, B.A. O. W. HUMPHREYS, B.Sc. C. R. KING, C.B.E. H. R. L. LAMONT, Ph.D., M.A., B.Sc. F. J. LANE, O.B.E., M.Sc. G. S. C. LUCAS, O.B.E.

G. LYON, M.Sc.(Eng.). SIR HAMISH D. MACLAREN, K.B.E., C.B., D.F.C., LL.D., B.Sc. W. F. PARKER.
PROFESSOR M. G. SAY, Ph.D., M.Sc.
R. L. SMITH-ROSE, C.B.E., D.Sc., Ph.D. G. O. WATSON.
J. H. WESTCOTT, B.Sc.(Eng.), Ph.D. E. L. E. WHEATCROFT, M.A. R. T. B. WYNN, C.B.E., M.A.

Chairmen and Past-Chairmen of Sections

Supply:

J. D. PEATTIE, B.Sc. *L. G. BRAZIER, Ph.D., B.Sc.

Utilization:

J. I. BERNARD, B.Sc. Tech. *B. L. METCALF, B.Sc.(Eng.).

Measurements:

T. E. GOLDUP, C.B.E.

S. E. GOODALL, M.Sc.(Eng.).

M. WHITEHEAD. *J. F. Coales, O.B.E., M.A.

Radio:

C. W. OATLEY, M.A., M.Sc. *J. A. SMALE, C.B.E., A.F.C., B.Sc.

J. H. MITCHELL, B.Sc., Ph.D.

East Midland Centre:

Mersey and North Wales Centre:

Chairmen and Past-Chairmen of Local Centres

North-Eastern Centre:

G. W. B. MITCHELL, B.A.

*H. ESTHER, B.Eng.

North-Western Centre:

Professor E. Bradshaw, M.B.E., M.Sc.Tech., Ph.D.

*H. WEST.

Northern Ireland Centre:

MAJOR P. L. BARKER, B.Sc. *J. R. W. MURLAND, B.Sc.(Eng.).

Western Centre:

A. N. IRENS. *J. VAUGHAN HARRIES.

* Past-Chairman.

Scottish Centre: J. S. HASTIE, B.Sc.(Eng.).

*C. H. A. COLLYNS.

South Midland Centre:

A. R. BLANDFORD.

*H. J. GIBSON, B.Sc.

Southern Centre:

E. A. LOGAN, M.Sc. *COMDR. C. V. ROBINSON, R.N., O.B.E.

North Midland Centre:

W. A. CROCKER.

*C. D. WILKINSON.

P. R. DUNN, B.Sc. *T. COATES, M.Eng.

*G. CATON.

Secretary

W. K. Brasher, C.B.E., M.A., M.I.E.E.

Assistant Secretary

F. C. HARRIS.

Editor-in-Chief

G. E. WILLIAMS, B.Sc.(Eng.), M.I.E.E.

Deputy Secretary F. JERVIS SMITH, M.I.E.E.

TABLE OF CONTENTS

VOL. 102, Part B

1955

	PAGE		PAGE
Inaugural Address by the President. J. Eccles, C.B.E., B.Sc	1	Discussion on "A Moving-Coil Relay applied to Modern High-	
Address of Chairman of Radio Section. C. W. Oatley, M.A.,		Speed Protective Systems" (Paper by C. Ryder, J. Rushton and F. M. Pearce), before the North-Western Measurements	
M.Sc	7	Group	112
Addresses of Chairmen of Local Centres:	4.40	A Transatlantic Telephone Cable. Mervin J. Kelly, Ph.D.,	
East Midland. J. H. Mitchell, Ph.D., B.Sc	143 145	D.Eng., D.Sc., LL.D., Sir Gordon Radley, C.B.E., Ph.D.(Eng.), G. W. Gilman, M.S., and R. J. Halsey,	
North-Western, Prof. E. Bradshaw, M.B.E., M.Sc.Tech., Ph.D.	147	B.Sc.(Eng.)	117
Northern Ireland, Major P. L. Barker, B.Sc.	149	Discussion:	
Addresses of Chairmen of Local Sub-Centres: North Staffordshire. J. M. Ferguson, B.Sc.(Eng.)	151	Before The Institution	130 717
Rugby. D. Edmundson, B.Sc.(Eng.)	152	Discussion on "Post-Graduate Activities in Electrical Engineer-	
South-Western. H. C. O. Stanbury, B.Sc.(Eng.)	153	ing" (Paper by W. J. Gibbs, D. Edmundson, R. G. A.	
The Properties of Artificial Dielectrics at Centimetre Wavelengths.		Dimmick and G. S. C. Lucas), before the North Midland	
J. Brown, M.A., and Willis Jackson, D.Sc., D.Phil., F.R.S.	11	Centre, the South Midland Centre, the Southern Centre and	120
Some Experiments on Artificial Dielectrics at Centimetre Wave-		the North-Eastern Centre	138
lengths. M. M. Z. El-Kharadly, B.Sc., Ph.D.	17	Discussion on "A Survey of Electrical Ceramics" (Paper by W. G. Robinson and E. C. Bloor), before the South-West	
A General Experimental Method to Determine the Properties of		Scotland Sub-Centre	154
Artificial Media at Centimetre Wavelengths, applied to an		The Standard Frequency Monitor at the National Physical	101
Array of Parallel Metallic Plates. R. I. Primich, Ph.D., B.Sc.	26	Laboratory. J. McA. Steele, B.Sc.(Eng.)	155
Discussion (communicated)	708	Standard Frequency Transmission Equipment at Rugby Radio	
The Relative Permittivity of Tetragonal Arrays of Perfectly Con-	700	Station. H. B. Law, B.Sc.Tech	166
ducting Thin Discs. J. Brown, M.A., and Willis Jackson,		Discussion on the above two papers and on "Standard Frequency	
D.Sc., D.Phil., F.R.S	37	Transmissions" (Paper by L. Essen):	
Discussion (communicated) on "The Effect of Irradiation on the		Before the Radio and Measurements Sections	173
Calibration of 2 cm-diameter Sphere-Gaps" (Paper by D. R.		,, North-Eastern Radio and Measurements Group	825
Hardy and T. E. Broadbent)	42	The Application of the Hall Effect in a Semi-Conductor to the	
Some Features of V.H.F. Tropospheric Propagation. M. W.	40	Measurement of Power in an Electromagnetic Field. Prof.	
Gough, M.A	43	H. E. M. Barlow, Ph.D., B.Sc.(Eng.)	179
Noise Generation in Crystals and in Ceramic Forms of Barium Titanate when subjected to Electric Stress. A. C. Kibble-		The Design of Semi-Conductor Wattmeters for Power-Frequency	
white, M.Sc., Ph.D.	59	and Audio-Frequency Applications. Prof. H. E. M. Barlow,	100
Discussion on "Special Effects for Television Studio Productions"		Ph.D., B.Sc.(Eng.)	186
(Paper by A. M. Spooner and T. Worswick), before the North		Audio-Frequency Power Measurements by Dynamometer Watt-	102
Midland Centre	68	meters. A. H. M. Arnold, Ph.D., D.Eng	192
Design of a Logarithmic Receiver. S. Rozenstein	69	Discussion on the above three papers before the Measurements Section	199
Discussion (communicated) on "A Method of Designing			177
Transistor Trigger Circuits" (Paper by F. C. Williams and	74	Signal/Noise Ratio in Pulse Code Modulation. N. L. Yates-Fish, M.A., D.Phil., and E. Fitch, B.Sc.	204
G. B. B. Chaplin)	74		204
Propagation in Curved and Twisted Waveguides of Rectangular Cross-Section. L. Lewin	75	The Notch Aerial and some Applications to Aircraft Radio Installations. W. A. Johnson, M.A	211
Noise in Cut-Off Magnetrons. R. C. Glass, B.A., B.Sc., G. D.		A Surface-Texture Comparator for Microwave Structures. A. F.	
Sims, M.Sc., B.Sc., and A. G. Stainsby, B.Sc.	81	Harvey, D.Phil., B.Sc.(Eng.)	219
Review of Long-Distance Radio-Wave Propagation above 30 Mc/s.		The Electroforming of Components and Instruments for Millimetre	
W. J. Bray, M.Sc. (Eng.), H. G. Hopkins, B.Sc., Ph.D., F. A.	97	Wavelengths. A. F. Harvey, D.Phil., B.Sc.(Eng.)	223
Kitchen, B.Sc., and J. A. Saxton, D.Sc., Ph.D.	87	An Experimental Study of the Propagation of 10 cm Radio Waves over a Short Non-Optical Sea Path. E. F. Stack-Forsyth.	
A Very-Wide-Band Dummy Load for Measuring Power at Very-	96	B.Sc., Ph.D.	231
High and Ultra-High Frequencies. W. Hersch, B.Sc.(Eng.)	70	The Launching of a Plane Surface Wave. G. J. Rich, M.Sc.	237
Experimental Equipment and Techniques for a Study of Millimetre- Wave Propagation, W. E. Willshaw, M.B.E., M.Sc.Tech.,		Discussion (communicated)	824
H. R. L. Lamont, M.A., Ph.D., and E. M. Hickin.	99	Cold Measurements of 8mm Magnetron Frequency and Pulling	027
Discussion (communicated)	312	Figure. A. E. Barrington, Ph.D., B.Sc.	247

	PAGE		PAGE
Discussion on "Printed and Potted Electronic Circuits" (Paper by G. W. A. Dummer and D. L. Johnston), before the South Midland Radio Group	248	A Transistor Digital Fast Multiplier with Magnetostrictive Storage. G. B. B. Chaplin, M.Sc., Ph.D., R. E. Hayes, B.Sc., and A. R. Owens, B.Sc.	
Discussion on "Electronic Telephone Exchanges" (Paper by T. H. Flowers), before the Mersey and North Wales Centre	249	Discussion on "Determination of the Static and Dynamic Elastic Properties of Resilient Materials" (Paper by R. S. Jackson,	
Surface Roughness and Attenuation of Precision-Drawn, Chemically Polished, Electropolished, Electroplated and Electroformed Waveguides. J. Allison, B.Sc.(Eng.), and F. A. Benson,	251	A. J. King and C. R. Maguire), before the North-Western Measurements Group and the North-Eastern Radio and Measurements Group	415
M.Eng., Ph.D. Discussion (communicated) on "Reception of an F.M. Signal in the Presence of a Stronger Signal in the same Frequency Band,	251	Electrical and Magnetic Measurements in an Electrical Engineering Factory. D. Edmundson, B.Sc.(Eng.)	400
and other Associated Results''	260	Before the Measurements Section	
Haine, M.Sc., and M. W. Jervis, M.Sc.Tech. A Precision Direct-Current Stabilizer. M. W. Jervis, M.Sc.Tech.	265 274	A Flux-Sensitive Reproducing Head for Magnetic Recording Systems. E. D. Daniel, M.A	442
Discussion on the above two papers before the Measurements Section	277	Discussion on "Some Applications of the Electrolytic Tank to Engineering Design Problems" (Paper by H. Diggle and E. R. Hartill), before the North-Eastern Radio and Measurements	
The Vertical Radiation Patterns of Medium-Wave Broadcasting Aerials. H. Page, M.Sc., and G. D. Monteath, B.Sc.	279	Group, the North-Western Centre and the South-West Scotland Sub-Centre	447
Discussion before the Radio Section	295	Maintenance Principles for Automatic Telephone Exchange Plant. R. W. Palmer	453
magnetic Theory" (Paper by P. Hammond):		Discussion before The Institution	463
Before the North-Western Centre	298	Amplification Factors and Mutual Conductance of a Beam Power Valve. S. Deb	469
Eastern Radio and Measurements Group An Attracted-Disc Absolute Voltmeter. G. W. Bowdler, M.Sc	716 301	Carrier-Leak in Rectifier Modulators of the Shunt Type. G. L. Connon, B.Sc.(Eng.)	475
Discussion:	210	A Double-Ground-Plane Strip-Line System for Microwaves.	
Before the Measurements Section	310 799	Bengt A. Dahlman	488
Discussion on "An Investigation of the Characteristics of Cylindrical Surface Waves" (Paper by H. E. M. Barlow and A. E.		A. F. Harvey, D.Phil., B.Sc.(Eng.)	493 752
Karbowiak), and "Surface Waves" (Paper by H. E. M. Barlow and A. L. Cullen), before the North-Eastern Radio and Measurements Group	312	On the Surface Impedance of a Corrugated Waveguide. A. E. Karbowiak, Ph.D., B.Sc.(Eng.)	501
An Experimental Investigation of Axial Cylindrical Surface Waves supported by Capacitive Surfaces. Prof. H. E. M. Barlow, Ph.D., B.Sc.(Eng.), and A. E. Karbowiak, Ph.D.	313	An Improved Chart for Ionospheric Forecasting in the British Zone. R. Naismith	503
Equipment of Instrumental Accuracy for Recording and Reproduction of Electrical Signals, using Cinematograph Film.		due to Disturbed Ionospheric Conditions. J. K. S. Jowett, B.Sc.(Eng.), and G. O. Evans, B.Sc	505
H. McG. Ross, M.A	323	Performance Characteristics of High-Frequency Radiotelegraph Circuits. A. M. Humby, C. M. Minnis, M.Sc., and R. J.	
Thermionic Valves of Improved Quality for Government and		Hitchcock, B.A. Discussion on the above two papers before the Radio Section	513 522
Industrial Purposes. E. G. Rowe, M.Sc., P. Welch and W. W. Wright, B.Sc.	343	Sources of Error in U-Adcock High-Frequency Direction-Finding.	
Discussion:	257	K. C. Bowen, B.A	529
Before the Radio Section	357 801	Radio Waves reflected at the Ionosphere. E. N. Bramley, M.Sc.	533
Mean Frequency Determination of Narrow-Band Noise Spectra. W. W. H. Clarke, Ph.D., B.Sc., and R. F. Nikkel, M.A.Sc.,		On the Rapidity of Fluctuations in Continuous-Wave Radio Bearings at High Frequencies. W. C. Bain, M.A., B.Sc., Ph.D.	
B.A.Sc	364	Some Comparative Directional Measurements on Short Radio Waves over Different Transmission Paths. E. N. Bramley,	
Ph.D	371	M.Sc	544 550
A 24-Channel Pulse-Time Modulation System. R. F. B. Speed, B.A.	375	The Mechanism of Sub-Harmonic Generation in a Feedback	330
Coupled Transmission Lines as Symmetrical Directional Couplers. G. D. Monteath, B.Sc	383	System. John C. West, B.Sc., Ph.D., and John L. Douce, M.Sc., Ph.D	569
Some Half-Tone Charge Storage Tubes. R. S. Webley, B.Sc., H. G. Lubszynski, Dr.Ing., and J. A. Lodge, B.Sc	401	Spring Non-Linear Characteristics to Step-Function and Random Inputs. John C. West, B.Sc., Ph.D., and P. N.	
Discussion on "An Analogue Computer for Use in the Design of Servo Systems" (Paper by E. E. Ward), before the South-		Nikiforuk, B.Sc., Ph.D. Discussion on the above two papers before the Measurements	575
East Scotland Sub-Centre	411	Section	594

The Adjustment of Central Systems for Quiel Transient Decrease	PAGE	Total Florida Dela Control Dela	PAGE
The Adjustment of Control Systems for Quick Transient Response. A. T. Fuller, M.A.	596	Traffic Flow in an Exponential Delay System with Priority Categories. R. E. Cox, B.Sc.(Eng.)	0 4 4
The Integral-of-Error-Squared Criterion for Servo Mechanisms. H. H. Rosenbrock, B.Sc.(Eng.), Ph.D.	602	The Measurement of Power at a Wavelength of 3 cm by Thermistors and Bolometers. J. A. Lane, M.Sc	819
Discussion on "The Manchester-Kirk o'Shotts Television Radio-Relay System" (Paper by G. Dawson, L. L. Hall, K. G. Hodgson, R. A. Meers and J. H. H. Merriman), before the Western Centre and the Southern Centre	607	Discussion on "Standard Frequency Transmissions" (Paper by L. Essen); "The Standard Frequency Monitor at the National Physical Laboratory" (Paper by J. McA. Steel); and "Standard Frequency Transmission Equipment at Rugby	
High-Speed Electronic-Analogue Computing Techniques. D. M. MacKay, B.Sc., Ph.D.	609	Radio Station" (Paper by H. B. Law); before the North-Eastern Radio and Measurements Group	000
Discussion before the Measurements and Radio Sections Artificial Reverberation. P. E. Axon, O.B.E., M.Sc., Ph.D.,	620	Discussion (communicated) on "Some Aspects of the Design of V.H.F. Mobile Radio Systems" (Paper by E. P. Fairbairn)	
C. L. S. Gilford, M.Sc., and D. E. L. Shorter, B.Sc.(Eng.)	624	Determination of the Reflection Coefficient of the Sea, for Radar- Coverage Calculation, by an Optical Analogy Method.	
Discussion before the Radio Section	640	G. W. G. Court, B.Sc	827
The Subjective Discrimination of Pitch and Amplitude Fluctuations in Recording Systems. A. Stott, M.A., and P. E. Axon, O.B.E., Ph.D., M.Sc.	643	Signalling Systems for Submarine Telegraph Circuits. C. J. Hughes, B.Sc.	831
A Study of the Long-Term Emission Behaviour of an Oxide-Cathode Valve. G. H. Metson, M.C., Ph.D., M.Sc.,		A New Perturbation Method for Measuring Microwave Fields in Free Space. Prof. A. L. Cullen, Ph.D., and J. C. Carr, B.Sc.	836
B.Sc.(Eng.)	657 675	Discussion on "Image Intensification in Radiology" (opened by W. J. Oosterkamp, M.A., Ph.D., and G. M. Ardran, M.D.)	
Some Experiments on the Breakdown of Heater-Cathode Insulation in Oxide-Cathode Receiving Valves. G. H. Metson, M.C., Ph.D., M.Sc., B.Sc.(Eng.), E. F. Rickard, B.Sc., and F. M.	678	Discussion on "Technical Colleges and Education for the Electrical Industry" (Paper by H. L. Haslegrave), before the North-Western Centre, the Southern Centre, and the East Midland Centre	
Discussion (communicated) on "Noise Generation in Crystals and Ceramic Forms of Barium Titanate when subjected to Electric	683	Digest of a Paper: Current Summations with Current Transformers. A. Hobson, M.Sc.Tech	719
A Milliwattmeter for Centimetre Wavelengths. A. C. Gordon-Smith	685	Digests of Institution Monographs: Vibratory Power Convertors: an Analysis of Performance and Design. R. H. Evans, B.Sc.	113
V.H.F. Aerials for Television Broadcasting. G. J. Phillips, M.A., Ph.D., B.Sc.	687	The A.C. Impedance of Plasma Discharges in Mercury Vapour.	
On Distributed Amplification. D. G. Sarma, M.Sc	689	S. E. Yussuf, Ph.D., and Prof. J. C. Prescott, D.Eng.	
Theory of Imperfect Waveguides: the Effect of Wall Impedance. A. E. Karbowiak, Ph.D.	698	The Effect of Severe Amplitude Limitation on Certain Types of Random Signal: a Clue to the Intelligibility of "Infinitely" Clipped Speech. J. M. C. Dukes, M.A	261
Measurements of the Effect of Rain, Snow and Fogs on 8.6 mm Radar Echoes. N. P. Robinson, M.A	709	The Generation of Millimetre Waves. J. L. Farrands, Ph.D., B.Sc.	264
Discussion on "Submerged Telephone Repeaters for Shallow Water" (Paper by R. J. Halsey and F. C. Wright), and "The		The Radiation of a Hertzian Dipole over a Coated Conductor. D. B. Brick, Ph.D., S.M., A.B.	392
British Post Office Standard Submerged-Repeater System for Shallow-Water Cables, with special mention of the England—		The Ionospheric Propagation of Radio Waves of Frequency 16 kc/s over Short Distances. T. W. Straker, M.Sc., Ph.D.	396
Netherlands System" (Paper by D. C. Walker and J. F. P. Thomas), before the North-Eastern Radio and Measurements Group and the South-Western Sub-Centre	714	A Table of a Function used in Radio-Propagation Theory. F. Horner, M.Sc.	400
An Introduction to some Technical Factors affecting Point-to-Point Radiocommunication Systems. F. J. M. Laver, B.Sc		Some Fundamental Properties of Networks without Mutual Inductance. A Talbot, M.A., Ph.D.	554
An Approximate Method for Obtaining Transient Response from	733	Leakage Flux and Surface Polarity in Iron Ring Stampings.	556
Frequency Response. H. H. Rosenbrock, B.Sc.(Eng.), Ph.D. Measurements of Junction-Transistor Noise in the Frequency		Signal/Noise Performance of Multiplier (or Correlation) and Addition (or Integrating) Types of Detector. D. G. Tucker,	
Range 7-50 kc/s. W. L. Stephenson, B.Sc	753	D.Sc., Ph.D	558
Waddell, M.A., S. E. Mayer, Ph.D., and S. Kaye, B.Sc Transistor Power Amplifiers. R. A. Hilbourne, B.Sc., and D. D.	757	at Low Power Levels. H. V. Shurmer, M.Sc., Ph.D Resonant-Cavity Measurements of the Relative Permittivity of	563
Jones, M.Sc	763	a D.C. Discharge. K. W. H. Foulds, Ph.D., B.Sc.(Eng.) The Stability and Time Response of Fast-Operating Closed-	564
Hooker, B.Sc	775	Loop Pulsed Radar Circuits. D. McDonnell and W. R. Perkins, B.Sc.	567
Microwave Diodes" (paper by G. R. Nicoll), before a Joint Meeting of the Measurements and Radio Sections	786	The Frequency-Response Analysis of Non-Linear Systems. P. E. W. Grensted, M.A.	721
Automatic Recording of the Direction of Arrival of Radio Waves reflected from the Ionosphere. J. A. Thomas, B.Sc., and R. W. E. McNicol, M.Sc.	793	Field-Dependent Conductivity in Non-Uniform Fields and its relation to Electrical Breakdown. P. T. G. Flynn, B.Sc. (Eng.), Ph.D	723
The Choice of Impedance for Coaxial Radio-Frequency Cables. W. T. Blackband, M.Sc.	804	Breakdown of Solid Dielectrics in Divergent Fields. J. H. Mason, B.Sc.	725

	PAGE	P	AGE
The Graphs of Active Networks. W. S. Percival, B.Sc. Residual Effects in the Campbell Bridge Method for t		The Residual Time-Constant of Self-Saturating (Auto-Excited) Transductors. Ulrik Krabbe, Ph.D	855
Absolute Measurement of Resistance, and a Note on a N Bridge. Prof. N. F. Astbury, M.A., Sc.D	729	Function Generators based on Linear Interpolation with Applications to Analogue Computing. E. G. C. Burt, B.Sc., and O. H. Lange, Dr.rer.nat	856
Frequency Band 0-4000 Mc/s. I. A. Harris The Correlation between Decay Time and Amplitude Respon		A Reflex Klystron Oscillator for the 8-9 mm Band. D. J. Wootton, B.Sc., and A. F. Pearce, Ph.D.	858
S. Demczynski, Dipl.Eng.	731	Index	861

KEY SHOWING PAGES CONTAINED IN EACH NUMBER OF PART B

Pages	No.	Month (1955)
1-116	1	January
117-264	2	March
265-400	3	May
401-568	4	July
569-732	5	September
733-860	6	November

CORRIGENDUM TO VOL. 102, PART B, 1955

Page 216, 1st sentence in Section 4.2: "112-118 Mc/s" should read: "108·1-111·9 Mc/s."

ADDITIONAL CORRIGENDUM TO VOL. 101, PART III, 1954

Page 141, col. 1, 5th line from bottom, and page 150, Reference 11: reference should also have been made to: Moore, J. B.: British Patent No. 480150.

Declaration on Fair Copying.—Within the terms of the Royal Society's Declaration on Fair Copying, to which The Institution subscribes, material may be copied from issues of the Proceedings (prior to 1949, the Journal) which are out of print and from which reprints are not available. The terms of the Declaration and particulars of a Photoprint Service afforded by the Science Museum Library, London, are published in the Journal from time to time.

Bibliographical References.—It is requested that bibliographical reference to an Institution paper should always include the serial number of the paper and the month and year of publication, which will be found at the top right-hand corner of the first page of the paper. This information should precede the reference to the Volume and Part.

Example.—Smith, J.: "Reflections from the Ionosphere," Proceedings I.E.E., Paper No. 3001 R, December, 1954 (102 B, p. 1234).